ABSTRAK

Adanya peningkatan suhu bumi merupakan bentuk dari adanya pemanasan global akibat emisi karbon ke atmosfer lebih banyak daripada pengikatan karbon oleh tumbuhan, sehingga konsentrasi karbon di atmosfer meningkat dan menyebabkan terjadinya efek rumah kaca. Proses pengikatan dan pelepasan karbon disebut dengan siklus karbon. Siklus ini merupakan siklus dua arah yang berupa keluaran dan masukan karbon. Tugas Akhir ini membahas tentang siklus karbon antara atmosfer dan vegetasi. Perubahan jumlah karbon terhadap waktu digambarkan dalam persamaan diferensial biasa yang diselesaikan dengan transformasi Laplace. Invers Laplace dari persamaan tersebut berupa model eksponesial yang merupakan persamaan jumlah karbon di atmosfer dan vegetasi. Hasil analisis model dan simulasi data menunjukkan bahwa jumlah karbon vegetasi mula-mula berbanding lurus terhadap jumlah karbon di atmosfer. Semakin banyak jumlah karbon mula-mula yang terdapat di vegetasi, akan semakin banyak pula kemungkinan jumlah karbon yang dilepaskan kembali ke atmosfer.

Kata kunci : Siklus Karbon, Transformasi Laplace, Model Eksponensial

ABSTRACT

An increase the temperature of the earth is a form of global warming due to carbon emissions into the atmosphere more than carbon emissions sequestration by plants, thus the increasing of the concentration of carbon in the atmosphere caused greenhouse effect. The process of binding and extrication of carbon is called carbon cycle. This cycle is a cycle which formed by two-way input and output of carbon. This final project is talk about the carbon cycle between the atmosphere and vegetation. Changes in a amount of carbon by the time is depicted in ordinary differential equations are solved by Laplace transform. Inverse of Laplace equation form from this model are exponential equations which describe the amount of carbon in atmosphere and vegetation. The results of the analysis model and simulation data showed that the number of initial vegetation carbon is directly proportional to the amount of carbon in the atmosphere. The increasing of the amount of carbon number in vegetation cause the increasing amount of carbon number which released to the atmosphere too.

Keywords: Carbon Cycle, Laplace transform, Exponential Model